

METHOD FOR FABRICATING A TRENCH CAPACITOR OF DRAM

Abstract

This invention discloses a method for fabricating a deep trench capacitor. A substrate is provided. A pad oxide layer and a pad nitride layer are stacked on a main surface of the substrate. A deep trench is etched into the substrate through the pad oxide layer and the pad nitride layer. A doped area is formed at the lower portion of the deep trench serving as the first electrode of the trench capacitor. A node dielectric is coated on the interior surface of the deep trench. A first polysilicon layer is deposited in the deep trench and is then recessed to a first depth. A silicon spacer layer is formed on sidewall of the deep trench over the node dielectric. An upper portion of the silicon spacer layer is doped with dopants such as BF_2 . The un-doped portion of the silicon spacer layer is selectively removed to expose a portion of the node dielectric. The exposed node dielectric is stripped off to expose the substrate. The remaining node dielectric covered by the doped silicon spacer layer form a protection spacer for protecting the pad oxide layer from corrosion during the subsequent etching

processes.